

DEVELOPMENT AND ASSESSMENT OF APPROPRIATE SAFETY PLAYGROUND APPAREL FOR SCHOOL AGE CHILDREN IN RIVERS STATE

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ABSTRACT

The major purpose of the study was to develop safety playground apparel for school age children in Rivers State, Nigeria. Specifically, the study assessed the appropriateness of various sizes of safety playground apparels prototypes by judges based on functional (movement/posture, fit, comfort, safety/protection, usability); expressive and aesthetic attributes. The study was carried out in Rivers State. The design for the study was Research and Development (R&D). Purposive sampling technique was used to select 9 user models and 20 judges that participated in evaluation of prototype safety playground apparel. The findings of the study established that the judges ascertained that the appropriateness of all the sizes (small, medium and large) of the safety playground apparel are good and satisfactory for protection and safety; for movement and posture; have good fit; comfort; usability; expressive and aesthetics attributes. Based on the findings, it was recommended among others that there should be compulsory utilization of safety playground apparel in schools; use of appropriate sizes of safety apparel by pupils and inculcation as a criterion in school accreditation.

KEYWORDS: Development, Safety, Play, Playground Apparel, School age

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INTRODUCTION

Play is an important part of everyone's life. It is a pivotal part of a child's life that fosters creativity, imagination, social connections and learned behavior. A considerable body of research has shown that play aids children learning and development (Zosh, Whitebread, Neale, Jensen, Liu, Lynne Solis, Hopkins & Hirsh-Pasek, 2017). Play is an activity performed for its own sake and play according to Parson (2011) refers to a range of voluntary, intrinsically motivated activities that are normally associated with pleasure and enjoyment". Gray (2013); Gunseli&Guzin, 2017) defined play as the act of passionately engaging in the surrounding world through "exploration, manipulation, physical exuberance, experimentation and pretence, either alone or with others". The authors further calls play a 'basic human drive' which is fundamental to human development.

Play contributes to healthy growth therefore it is important for optimal child healthy development. Children need to spend time to play to be healthy and happier. This means that opportunities for play must be provided if children are to develop mentally, physically, socially, intellectually and emotionally. It is through play that children at a very early age engage and interact in the world around them. Play allows children to create and explore their world holistically and with multifaceted ways (Sharif, 2014). Play helps children develop new competencies that lead to enhanced confidence and the resiliency needed to face future challenges.

Play has been recognized as a right of every child. In fact, play is so essential that it is included in Article 31 of the United Nations Convention on the Right of the Child which states that “it is not only a right for children to be engaged in play, but it is also a matter of equal opportunity for all children” (United Nations Convention on the Right of the Child (UNCRC) 2016). Similarly, in Nigeria, the Child Right Act section 1 stipulated that a Nigerian child has the right to leisure, cultural activities and to engage in different types of play (Child Right Act, 2003). Different types of play exist and children of school age engage themselves in different types of play during play time.

School Age also is the period of life between 6 - 12 years which is a period for primary education in Nigeria. The Federal Republic of Nigeria (FRN) (2014) defined primary education as a period for formal training of children aged 6-11 plus. School age is a stage in life where children move into expanded roles and environment. It is a unique active developmental stage at which children undergo critical physical, cognitive and social changes. At this stage, children begin to spend more time away from their family as they are in schools most of the times. Also, during this stage of life, children of school age are active and full of life for various activities and play (Huff, 2013).

School age children are involved in numerous play activities (rough and tumble play) that results to injury in the playground. An injury often occurs in playground as a result of slip or falls, falls from equipment, being struck by or against objects and use of inappropriate and unsafe playground apparels. The use of inappropriate and unsafe playground apparels in playground has resulted to varying degree of injuries for school age children. Injury caused by use of inappropriate safety playground apparels has become a public health issue in Rivers State and Nigeria at large. Occurrence of playground injuries has brought a lot of misfortune and suffering to school age children and their parents. Most times, children stay away from school and are hospitalized for months as a result of injuries sustained during play in the playground. This has caused family spending huge amount of money on hospital bills. Such injuries can also result to mortality thereby affecting the future human resources of the country. The use of appropriate and safety playground apparels is one of the numerous ways' playground injuries can be reduced or prevented. However, there has been paucity of empirical studies focusing on development of appropriate and safety playground apparel issues particularly concerning school age children in Rivers State. Despite the benefits of play, some schools discontinue play time and have even banned play activities deemed unsafe in order to prevent children from injury. Play time in most schools in the study area is often used as meal time in classrooms. This is one of the strategies used by schools in the area to prevent injuries that occurs as a result of play. Negatively, this deprives children of their play time and benefits of play to them. This should not be so as there are numerous measures schools can take to address these problems of injuries at play and protect children while still preserving play. One of these measures is the use of appropriate safety playground apparels by children during play, hence the present study which sought to develop safety playground apparels with impact absorbing features that will help prevent and reduce injuries.

Safety playground apparels are clothing's, garments, attires or anything that covers the body and protects the body from injury. In this study, safety playground apparels refer to the safety playground clothing worn by children of school age for protection against injury in the playground. These apparels are specially prepared to help protect these groups of children from injury within the school playground. This means that safety playgrounds apparels are clothing's that are designed to protect the wearer from harsh environmental effects that may result in injury or death. According to Bishop, Balilonis, Davis and Zhang (2013) safe apparel is needed in work or sports to protect the wearer against hazards, impact, abrasion and toxic substances. Protective and safe apparel may also be used to enhance performance. The authors also

noted that safe apparels are important because it gives protection against hazards from extreme heat and fire, cold, harmful chemicals or gases, bacterial/viral environment, contamination, ballistic hazards, electrical hazards, radiation hazards etc. With reference to school, safety playground apparels when used by children of school age in the playground gives protection from injuries that may occur as a result of slip, trip or falls (when running, jumping, sliding among others), falls from equipment, athletic participation in a game when struck by or against objects. Safe playground apparels prevent or minimize hazardous conditions that can cause body injury such as cuts, bruises, lacerations, dislocation and fracture. Body injury could result in playground as a result of poorly maintained playing equipment, inappropriate impact absorbing surfaces, falls from equipment, lack of supervision as well as use of inappropriate safety playground apparels (Eligbobo, Nzomiwu, Amobi & Etim, 2014).

Safety playground apparels can reduce the frequency and extent of abrasions and lacerations of the skin and soft tissue during falls (Haworth, Rome, Varnsberry and Rowden, 2007). Unfortunately, many playgrounds in Rivers State, Nigeria are hazardous to children when playing and had failed to provide a stimulating environment for play. Eligbobo, Nzomiwu, Amobi & Etim (2014) stated that majority of the playground surfaces in these areas were bare earth and does not give room for adequate fall absorbency. The author further revealed that appropriate and safe play apparels for different sports and play activities are not available in these areas. The current clothes commonly worn by children of school age for rough and tumble play activities is Physical Education (P.E) wear which is inappropriate for injury prevention and reduction. This P.E wears comprises of jersey tops and shorts. Most of these jersey tops have sleeves that stop at the arm circumference or above the elbow. The shorts or culottes skirts worn by girls in most cases are too short. These wears do not protect the elbow, knees, and other areas of the body that are susceptible to injuries when accidents occur in the playground during play. This is because it lacks impact absorbency during falls. Moreover, the needs and play activities of the children were not put into consideration before producing them and one of the strategies for reducing injuries in playgrounds is through the use of safety playground apparels. Therefore, the need for safety playground apparel is eminent.

Safety apparels according to Gupta, (2011) are clothing that protects individuals who are expose to life threatening or hazardous environments during work, play or sporting activities. It could be ascribed to all clothing that protects from environmental hazard, biological, chemical and radiation hazard as well as impact and injury protection. The author further stated that safety clothing falls under the class of protective functional clothing. The protective functionality can be sub-classified into three categories based on the nature of the threat from which protection is required. These categories include; environmental hazard protection (protection from environmental conditions (natural or man-made) such as extreme heat or cold, fire, rain, snow, dust, wind or ultra violet exposure; biological, chemical and radiation hazard protection (protection from hazardous chemicals, toxic gases, body fluids, germs or radioactive particulate matter); Injury hazard protection (protection from mild to fatal injuries caused by ballistic, blunt and mechanical impact or cut and slash hazards from a variety of sources). The principle that guides the development of protective or safety apparels for injury reduction or prevention involves padding with fibers that can provide impact resistance. Therefore, corresponding protective/safe apparels should meet with the protective and safety needs of children of school age. Safety playground apparels that is able to meet all the desired safety apparel needs is based on the way it is designed during development.

Development means to change with a specific direction in order to create something new. Development is seen as a process of producing something tangible (Encyclopaedia Britannica, 2008). The overall process of development of safety

apparel designing starts and ends with meeting the specific needs of the users. However, at the information gathering stage, focusing on the needs and preferences of the target consumer lays much more emphasis on functional design (Carrol and Kincade, 2007). Apparel development processes consist of several steps: identification of the needs of the wearer, measurement and sizing, drafting the pattern and construction of the apparels (Iamb and Kallal, 1992). In all, prototype apparels should be produced, tested and corrected to meet the desired specifications of a design. Prototype apparel is apparel made to the specification of a design for the purpose of fitting, using a cheap fabric. Also, in developing apparel, there is need for the design or sketching of apparel, production of pattern, cutting and sewing of garments (Ayim, 2018). These design processes will be utilized in the development and designing of safety playground apparels. Design criteria are specification required to produce safety apparels for children of school age for play activities.

Need assessment has been utilized by many apparel researchers when designing apparel for special user group (Chae& Schofield-Tomschin, 2010). The activities performed by children of primary school age in playground most times involve risk and possibilities of being injured. According to United Nations Children Educational Fund (UNICEF) (2014) The use of protective/safety apparels will help reduce and prevent injury sustained from accidents during play.

This study was aimed at developing safety playground apparels which will help reduce and prevent injury that occurs as a result of accidents in the playground. The safety playground apparel was developed based on the play activities performed by children of school age while ensuring comfort, fit, movement/posture and protection/safety during play in playground. The safety apparels will provide protection against areas of the body that is susceptible to injuries when an accident occurs in the playground. Hence, a need existed to develop appropriate safety playground apparels for children of school age to prevent and reduce injury occurrence which was not well provided by the school authority and clothing industry.

Research Questions

- What are the mean ratings of the judges on the appropriateness of the safety playground apparels of children of school age by judges based on Functional Attributes (comfort, movement, Protection/safety and usability)?
- What are the mean ratings of the judges on the appropriateness of the safety playground apparels of children of school age by judges based on expressive and aesthetic attributes?

METHODS

The study was carried out in Rivers State, Nigeria. Research and Development (R&D) design was utilized for the study. Nine (9) user models and Twenty (20) judges were purposively selected. To assess the appropriateness of the prototype apparel developed based on the variables under study. This comprised: 5 Home Economics lecturers, 5 registered primary school teachers, 5 parents and 5 fashion designers. The instruments for data collection included standard body measurement chart (SBMC) for obtaining measurement for small, medium and large sizes for school age children and Safety Apparel Design Assessment Instrument for Judges (SADAIJ). The following procedures were adopted for the study: sketching of selected designs; Development of blocks and adaptation of patterns pieces based on the designs in sizes of small, medium and large; selection of fabrics and materials that was used for construction of prototype; Construction of safety apparel based on selected designs for the three sizes; selection of models in small, medium and large size categories; Assessment of prototype and making of corrections.



Figure 1: Sections of Judges Assessing Safety Playground Prototype on User Models at Different Posture

Table 1: Mean Ratings of the Appropriateness of Various Sizes of Safety Playground Apparel by Judges on Functional Attributes N = 60

S/N	Functional Attributes	Small size		Medium size		Large size		AM	ASD	Remark
		M	SD	M	SD	M	SD			
A	Comfort									
1.	Comfortable for the wearer	3.09	.46	3.28	.35	3.15	.31	3.17	0.37	S
2.	Non-irritating in wear	4.52	.31	3.32	.27	3.33	.36	3.72	0.31	S
3.	Garment ease	3.18	.38	3.10	.29	3.29	.39	3.19	0.35	S
4.	Allows heat of the body to escape	3.79	.40	3.31	.31	3.23	.36	3.44	0.36	S
5.	Allow task performance	3.60	.33	3.05	.36	3.62	.38	3.42	0.36	S
6.	Feel on the body	3.31	.35	3.42	.34	3.34	.37	3.36	0.35	S
7.	Cool to the body	3.26	.35	3.73	.35	3.41	.36	3.47	0.35	S
8.	Soft to the skin	4.12	.39	3.44	.31	3.66	.39	3.74	0.36	S
B	Movement									
9.	Free arm movement	3.72	.31	3.21	.37	3.26	.34	3.39	0.34	S
10.	Free leg movement	3.40	.28	3.39	.34	3.91	.33	3.57	0.32	S
11.	Free torso movement	3.52	.33	3.14	.29	3.46	.33	3.37	0.32	S
12.	Ease of reaching	3.00	.36	3.07	.30	3.20	.26	3.09	0.31	S
C	Protection and safety									
13.	Provide protection	3.62	.26	3.36	.17	4.12	.24	3.70	.22	S
14.	Easy to wear	3.10	.18	3.87	.14	3.33	.16	3.43	.16	S
15.	Easy to remove	3.85	.32	3.29	.09	3.08	.19	3.41	.20	S
16.	Easy to attach parts	3.63	.21	3.71	.20	3.52	.25	3.62	.22	S
17.	Easy to detach parts	4.22	.26	3.40	.19	3.10	.21	3.57	.22	S
18.	Portable	3.41	.63	3.18	.24	3.14	.22	3.24	.36	S
19.	Safe	3.68	.35	3.23	.15	3.51	.12	3.47	.21	S
20.	Light weight	3.32	.29	3.01	.11	3.66	.28	3.33	.23	S
21.	Water repellent	3.55	.19	3.56	.21	3.00	.18	3.37	.19	S
22.	Fastening	3.90	.20	3.11	.28	3.34	.20	3.45	.23	S
D	Usability									
23.	Aids activity performance	3.79	.26	3.48	.22	3.55	.21	3.61	0.23	S
24.	Easy reach to play items/equipment	3.82	.21	3.56	.25	3.63	.26	3.67	0.24	S
25.	Easy to care apparel	3.68	.28	3.86	.20	3.59	.29	3.71	0.26	S
26.	Durability	3.76	.20	3.91	.29	3.73	.26	3.8	0.25	S
27.	Quality of apparel	3.96	.23	3.69	.23	3.62	.28	3.76	0.25	S
28.	Fits of garment	3.83	.25	3.83	.28	3.84	.27	3.83	0.27	S
29.	Acceptability	3.92	.25	3.73	.25	3.51	.26	3.72	0.25	S
30.	Conceals dirt	3.84	.29	3.74	.29	3.56	.29	3.71	0.29	S
31.	Affordable	3.75	.20	3.78	.24	3.59	.24	3.71	0.22	S
32.	Easy use of fastening	3.69	.22	3.85	.21	3.64	.25	3.73	0.23	S

Note: AM = Average Mean; ASD = Average Standard Deviation; S = Satisfactory

Table 1 shows the ratings of the appropriateness of various sizes of safety playground apparel by Judges based on functional attributes (Comfort, movement, protection/safety and usability). The table shows the response for comfort with mean values ranging from 3.18 to 4.52 for small size; 3.05 to 3.42 for medium size; 3.15 to 3.62 for large size. These mean values were above the cut-off point of 3.00 which is greater than the 3.00 cut-off point indicating that judges satisfactorily accepted the comfort and overall performance of the prototype safety playground apparels. Hence, safety playground apparels are comfortable to wear, non-irritating in wear, garment has adequate ease, allows heat to escape from the body, allow activities performance, comfortable feel on the body, cool to the body and soft to the skin

Responses on functional attributes for movement indicated that all items were rated satisfactory for all the three

sizes. The mean values ranged from 3.00 to 3.72 for small size; 3.07 -3.39 for medium size and 3.20 to 3.91 for large size which is above cut off point of 3.00. This implies that safety playground apparels allows for free arm movement, free leg movement, free torso movement and ease of reaching items.

Protection and safety attributes were all rated satisfactory. The mean values ranged from 3.10 to 3.90 for small size; 3.01 to 3.71 for medium size and 3.00 to 4.12 for large size which is above the cut-off point of 3.00. This indicates that the safety apparels provide protection for wearers, it is easy to don and doff (wear and remove), easy to attach and detach parts of the apparels, its portable and not heavy for the wearer, safe to wear, light weight, water repellent with fastenings that are easy to open and close.

Responses on usability attributes of safety playground apparels shows that all the items were rated satisfactory for all three sizes. The mean values range from 3.69 to 3.96 for small size, 3.45 to 3.91 for medium size and 3.51 to 3.84 for large size which is above the cut-off point of 3.00. This indicates that the safety playground apparels aids activity performance, allows easy reach to items, easy to care, durable, high quality, adequate fit, acceptable, conceals dirt's, affordable and easy use of fastening. Therefore, the safety apparel is appropriate in comfort, movement, protection/safety and usability in task performance of children of school age. The standard deviation of the responses ranged from 0.09 to 0.63 indicating that the mean values were not far from each other and that there is less dispersion due to closeness of the values.

Research Question 2

What are the mean ratings of the judges on the appropriateness of the safety playground apparels of children of school age by judges based on expressive and aesthetic attributes? Answers to this research questions were shown in table 2 and 3

Table 2: Mean Ratings of the Judges on the Appropriateness of the Safety Playground Apparels on School Age Children by Judges on Expressive Attribute N = 60

S/N	Expressive Attribute	Small size		Medium size		Large size		AM	ASD	Remark
		M	SD	M	SD	M	SD			
1.	Identifies role	3.36	.22	3.38	.25	3.35	.23	3.36	0.23	S
2.	Promotes play value	3.42	.11	3.36	.24	3.34	.24	3.37	0.19	S
3.	Projects self- image	3.27	.28	3.47	.22	3.39	.21	3.38	0.24	S
4.	Promotes self- confidence	3.46	.24	3.33	.29	3.45	.24	3.43	0.26	S
5.	Enhances self esteem	3.35	.19	3.38	.23	3.41	.21	3.38	0.21	S
6.	Impression of competence	3.37	.15	3.36	.23	3.43	.27	3.39	0.22	S
7.	Sense of belonging	3.39	.18	3.32	.20	3.36	.26	3.36	0.21	S

Note: AM = Average Mean; ASD = Average Standard Deviation; S = Satisfactory

The result in Table 12 shows the ratings of the judges on the appropriateness of the safety playground apparels of children of school age by judges on expressive attributes. The table shows with mean values ranging from 3.27 to 3.46 for small size, 3.32 to 3.47 for medium size and 3.34 to 3.45 for large size which are above the cut-off point of 3.00. The result shows that the judges were satisfied with the expressive variables of the prototype safety playground apparels. This indicates that the safety garment is appropriate for role identification, promoting play values, and project self-image, promotes self- confidence, enhances self - esteem, gives impression of competence and portrays sense of belonging. The standard deviation ranged from 0.20 to 0.29 implying that the mean responses in the items indicates less dispersion due to the closeness of the values.

Table 3: Mean Ratings of the Judges on the Appropriateness of the Safety Playground Apparels on School Age Children by Judges on Aesthetic Attributes N = 60

S/N	Aesthetic attributes	Small size		Medium size		Large size		AM	ASD	Remark
		M	SD	M	SD	M	SD			
1.	Texture of fabric	3.11	.27	3.22	.22	3.00	.28	3.11	0.26	S
2.	Colour of fabric	3.28	.24	3.31	.26	3.50	.33	3.36	0.28	S
3.	Fashionable	3.45	.31	3.15	.31	3.94	.37	3.51	0.33	S
4.	Beautiful	3.72	.35	3.25	.24	3.21	.27	3.39	0.29	S
5.	Attractive	3.55	.22	3.37	.27	3.44	.34	3.45	0.28	S
6.	Style/design	3.26	.33	3.53	.37	3.38	.29	3.39	0.33	S
7.	Fabric design/pattern	3.17	.38	3.12	.33	3.56	.29	3.28	0.33	S
8.	Garment shape	3.24	.34	3.19	.25	3.47	.32	3.30	0.30	S
9.	Appealing	3.32	.39	3.20	.32	3.31	.35	3.28	0.35	S
10.	Trimming's	3.41	.28	3.33	.38	3.55	.33	3.43	0.33	S
11.	Construction details	3.56	.24	3.06	.35	3.26	.26	3.29	0.28	S
12.	Colour combination	3.63	.36	3.14	.30	3.45	.35	3.41	0.34	S
13.	Fullness disposal	3.10	.31	3.52	.29	3.43	.26	3.35	0.29	S

Note: AM = Average Mean; ASD = Average Standard Deviation; S = Satisfactory

Table 3 shows the ratings of the judges on the appropriateness of the safety playground apparels of school age children by judges on aesthetic attributes. The table shows mean values ranging from 3.10 to 3.72 for small size, 3.06 to 3.53 and 3.00 to 3.94 for large size which is greater than the 3.00 cut-off point. The result shows that the judges satisfactorily accepted the aesthetic variables of the safety playground apparels. This indicates that the texture and colour of the safety apparels are appropriate, apparel is fashionable, beautiful, attractive, style and design and fabric design is appropriate, garment shape is satisfactory, trimming's, colour combination and fullness were well achieved which shows excellent attributes. Therefore, the safety apparel is appropriate in aesthetic attributes for play activities performance of children of school age. The standard deviation of the responses ranged from 0.22 to 0.39 indicating that the mean values were not far from each other.

DISCUSSION OF FINDINGS

The findings of this study established that the judges ascertained that the sizes of safety playground apparel are good and satisfactory for protection and safety; the appropriateness of all the sizes (small, medium and large) of safety playground apparel as good and satisfactory for movement and posture; revealed that all the sizes (small, medium and large) of safety playground apparel have good fit; opined that all the sizes (small, medium and large) of safety playground apparel are good and satisfactory for comfort. The findings of this study further revealed that the judges established that all the sizes (small, medium and large) of safety playground apparel are all good for use; revealed that all the sizes (small, medium and large) of safety playground apparel are all satisfactory in expressive attribute; opined that all the sizes (small, medium and large) of safety playground apparel are good and satisfactory in aesthetic attributes. In support of these findings, Gupta (2011) agreed with the opinion of the teachers, parents, apparel designers and Home Economics lecturer who are judges that children of middle childhood age safety apparel for sporting and play activities in school should match the motion, degree of freedom, range of motion and movement of human joints in addition to being comfortable to the wearer. Also, United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2010) agreed with the findings of this study that the safety apparel to be used by children in the school playground should be such that can either minimize or eliminate risky conditions or threats that may cause accidents, body injuries, emotional and psychological distress to the young children during playing.

CONCLUSIONS

Based on the findings, the study concludes that safety playground apparel design and development is paramount at this time for safety and protection of school age children who are always involved in different play activities. It also concluded that the design criteria established was appropriate for the achievement of excellent safety playground apparel which could enhance effective protection of school age children during play.

RECOMMENDATIONS

Based on the findings of the study, the following are recommended:

- Use of safety playground apparel should be introduced to schools and be made compulsory for children of school age in their respective schools.
- Teachers and school authorities should be adequately instructed not to allow children of school age to participate in any play activities in the school playground except they put on their safety playground apparels.
- Appropriate sizes of the safety playground apparel should be used by each child in order to avoid the risks attached to wearing over-size apparel where children activities include running, jumping among others.
- Safety playground apparel should be given wide publicity within and outside the school with appropriate information on its potentiality in reducing or eliminating fatalities during playground activities in schools.

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